

***The International Society for
the Study of Dendrobatid Frogs***

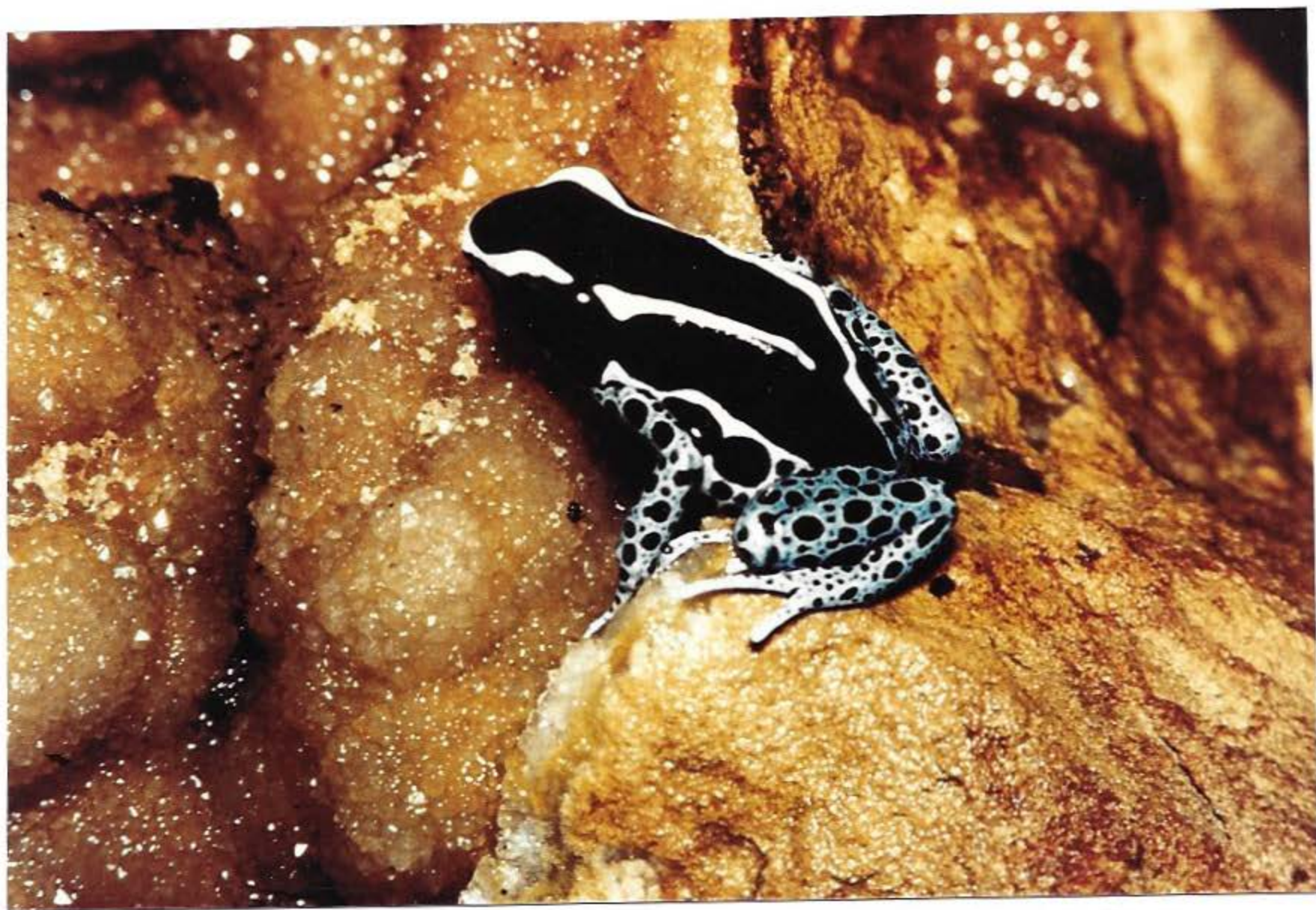


Bulletin of the ISSD
June 1991

Notes from the Editors

You may be asking, why you haven't seen more copies of the **ISSD Bulletin** this year. The answer is because there has been no material sent in for publication, and there will not be another issue of the **Bulletins** until new material is submitted. I really hate to keep harping on this subject, but if you don't sit down and send in something for the **Bulletin**, there will not be future issues.

I am also asking for help in producing the **ISSD Bulletin**. In December we are expecting our fourth child and I will not have the time or the stamina to call and write people asking for articles. I will still be quite willing to put together the **Bulletin** on my computer but someone else will have to take up the job of trying to get articles to keep us going. You may think that this is a thankless job and I must admit that it is. But you will learn more about dart-poison frogs in a year than most people will in 10 and you will also make contact with some of the best people keeping and breeding these frogs in the United States and Europe - an exchange that makes the job very rewarding. If you are considering the job please contact me, Charles Powell (2932 Sunburst Dr., San Jose, CA 95111; Tel. (408) 363-0926), so we can discuss it.



Dendrobates tinctorius (Schneider) Photographed by Dale Bertram

This is powder blue form of *D. tinctorius*. Other forms of this species have been previously illustrated in ISSD Newsletter. *Dendrobates tinctorius* is one of the most variable of the Dendrobatid species. According to Silverstone (1975, A revision of the poison-arrow frogs of the genus *Dendrobates* Wagler, Natural History Museum of Los Angeles County, Science Bulletin 21) it can be distinguished from *D. auratus* and *D. truncatus* in having reticulation, from *D. galactonotus* in lacking a tarsal tubercule, and from *D. azureus* in having a straight posture in life and a relatively larger, distinct tympanium.

This species is found in lowland forests in Guianas and adjacent northern Brazil.

Ants-An alternative food source for Dendrobatids

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In our never ending quest for a balanced and varied diet for our tiny charges we have two options, we can either collect it or culture it. Unfortunately our frequently too busy schedules allow little time to spend collecting food for our frogs. This leaves culturing as our best option.

The most commonly cultured insects are the fruit flies *Drosophylla melanagester* and *D. virilis*, also frequently cultured are crickets and at least one species

of Dermostid beetle. Now this may seem like a fairly wide variety especially if you're able to supplement with wild collected insects. But when you consider the thousands of different food animals available to the frogs in the wild we see that we are able to actually offer very little variety.

So, how do we remedy this situation? Well obviously we must find something else to culture. However because of the small size of the mouths we must feed, our choices are limited. After much thought I decided to culture ants. As ant farm veterans will remember you can't just collect a bunch of ants and expect them to reproduce, since in most cases there is only one active reproductive female in any colony. So the key to success is to somehow collect the queen.

There are several ways to accomplish this. First and least practical is excavate an ant colony hoping to find the queen. This can

be loads of work with no guarantee. Second you can turn over lots of rocks and wood in the hopes of finding a complete colony. The four ant colonies I currently have were all collected in this manner. The easiest way to obtain your breeding colonies is to collect females on their nuptial flights. After spring or fall rains they can often be found in large numbers, especially at night where they are attracted to lights. It is important not to collect winged sexuals from the colony as most ants do not mate within the nest confines, but only during or after a period of flight. When collecting queens you should collect as many as you can. It's not unusual for most nest foundresses to fail for one reason or another.

Well now that you've collected your ants what do you do with them? All you need is a plastic box with a tight fitting lid, a 6-inch test tube, cotton ball, and modeling clay. First, you want to

put a small amount of Vaseline around the upper perimeter of the box, this will keep ants confined to the box should you leave the box open. Next, take your test tube and put 1 to 1.5 inches of water into it, and put a portion of the cotton ball into the tube until it touches the water. If you've collected a large colony you may want to set up a couple of bottles this way. Now with the clay you secure your test tube against the side and bottom of the box. This is now your ants water supply. They will also probably maintain all their brood in these tubes. The water is one of the most important items to the set up, ants go quite awhile without food, but will dry up and die very rapidly without water.

Unless you're unlucky enough to have picked one of these rarer species with very specific dietary requirements, feeding your colony shouldn't prove to be difficult. Just what you feed your

colonies is based on their natural preferences. If you haven't got a clue what to feed them the best way to figure it out is the shotgun method - you offer a wide variety of food items and let them take their pick. Remember, even though an ant species may show preferences for a specific type of food they are still basically omnivorous so they should always be given a variety of foods. An example of this are ants of the genus *Camponotus* (Carpenter Ants). They are primarily feeders of nectar and honey dew, so I keep a small amount of honey water available at all times, however they just love the freshly killed cricket they receive once a week. I also have two colonies of the genus *Pheidole*. These ants are typically grainiferous, however they also readily take freshly killed crickets and honey water in addition to their high cereal dog chow.

In choosing an ant species

to breed you must keep in mind the size of the frog and plan accordingly. The best ant I have found so far is the genus *Pheidole*, they quickly produce large colonies and are a size easily handled by frogs of all sizes. Other suitable genera are *Brachymyrmex*, *Crematogaster*, *Iridomyrmex* (Argentine Ants), *Monomorium*, and some of the smaller *Componotus* species. I would avoid ants like *Solenopsis* (Fire Ants), although small enough, they can pack a pretty potent sting. I would also avoid using ants with large powerful jaws. *Pheidole* does produce a caste in its colonies with large powerful jaws, but they are few in number and easily avoided when collecting ants to feed your frogs.

The easiest way to handle your ants is with a device called an aspirator which is readily available from most biological supply companies. If you have question I will be happy to help.

-Breeder's Forum-

Charles Powell asks "I would like to know if anyone has any data on what species (or genera, for that matter) of bromalids are used by various dendrobatid species in the wild. I would think that Central and South American dendrobatids would use different species of bromalids which occur in their local surroundings. I would also be interested in knowing which species do not use bromalids to lay their eggs but rely on leaf litter or other microhabitats in the wild."

Mikael Qwibery (Furugatan 58, S-62144 Wisby, Sweden. Tel.: 46-49871948) states "One of the goals of the ISSD is 'to encourage the establishment and maintenance of stable and genetically diverse captive populations of endangered or threatened species.' It must therefore be in the interest of ISSD to spread animals and knowledge over the world. I would be very happy if members of ISSD could make a drawing of their terrarium construction as 'a picture tells more than a thousand words,' at least to me. I am willing to copy and distribute these drawings to any interested members."

-Want Adds-

Terry Chatterton (8007 Ridge Route, Arvada, CO. 80002 Tel.: (303) 420-7647). *Dendrobates imitator*, 1/2" newly metamorphosed juveniles, \$75.00 each or will consider trade for other frogs.

William Drever-Harper (248 W. 10th St., Claremont, CA 91711 Tel.: (714) 624-2063). 1' x 2' sheets of natural cork bark mounted on masonite. Makes a great backdrop for terrariums! \$10.00 per sheet (plus shipping).

Sean Healy (3140 Savage Rd., Sarasota, FL 34231 Tel.: (813) 924-5177). Juvenile F1 from wild caught, Costa Rican *Dendrobates auratus*, for sale - \$25.00 ea. Live delivery is guaranteed only with air freight collect shipments. Sales will be made on a first come, first served basis. Inquiries should be made on weeknights between 8pm and 11pm.

-Announcement-

Rainer Schulte long time resident of Peru is seeking funds to develop a Center of Dart-Poison Frog Studies to be built in the United States. As a resident of Peru he has field experience with many of the Peruvian dart frogs and hopes to bring breedings stock of many species into the United States. A preliminary site for this proposed project is Florida, but if anyone associated with a Zoological Garden or University is interested in this project please contact the Dr. J. K. Frenkel (1252 Vallecita Dr., Santa Fe, New Mexico 87501. Phone or Fax: (505) 984-2520). Investments are also actively being sought and they can be sent to either Dr. J. K. Frenkel or the Bulletin editor (Charles Powell, II, 2932 Sunburst Dr., San Jose, California 95111).

New Literature

Aichinger, Manfred, 1991, A new species of poison-dart frog (Anura: Dendrobatidae) from the Serranía de Sira, Peru. *Herpetologica*, 47(1): 1-5.

A new species of poison-dart frog, *Dendrobates sirensis*, is described from the Serranía de Sira, an isolated mountain range in east-central Peru, Departamento Huánuco, at an elevation from 750-1560 m. Adult specimens have a snout-vent length of 16-17 mm. The species is easily diagnosed from all dendrobatids by the uniform red coloration of the dorsum and the turquoise-green limbs.

Bunnell, Pille, 1973, Vocalizations in the territorial behavior of the frog *Dendrobates pumilio*. *Copeia*, 1973: 277-284.

The uniform distribution of site specific male *Dendrobates pumilio* is locally mediated and behaviorally reinforced. The territoriality thus expressed is probably essential to the mating and parental care behavior of this species.

Donnelly, Maureen A., 1989, Reproductive phenology and age structure of *Dendrobates pumilio* in northeastern Costa Rica. *Journal of Herpetology*, 23(4): 362-367.

Dendrobates pumilio occurs year-round at the La Selva Biological Reserve in northeastern Costa Rica. To determine seasonality in reproduction and age structure, a sample of 468 individuals was dissected and the conditions of gonads, reproductive tracts, and vocal slits were examined. There were no obvious seasonal trends in patterns of overall abundance, although seasonal reproduction was indicated by pulses in the appearance of small juveniles and

changes in female reproductive condition.

Durant, Pedro and Dole, Jim W., 1975, Aggressive behavior in *Colostethus* (= *Prostherapis*) *collaris* (Anura: Dendrobatidae). *Herpetologica*, 31: 23-26.

Aggressive behavior among individual frogs (*Colostethus collaris*) is described. Both sexes engaged in such activities, but female female did so more commonly than male male. Aggressive acts on the part of female female included throat display and pulsation, striking an intruders snout with her chin, pushing chasing, and leaping on an intruder's back or head. Among male male all the above behavior patterns except throat display and pulsation were seen; "lunging" toward intruder and "pushup" display, were observed in one male each.

Edwarda, S. R., 1974, Taxonomic notes on South American Dendrobatid frogs of the genus *Colostethus*. Occasional Papers (Museum of Natural History, The University of Kansas), 30: 1-14.

Phyllobates riocosangae Andersson, 1945, is synonymized with *Colostethus taeniatus* (Andersson, 1945), and *C. intermedius* (Andersson, 1945) is removed from synonymy with *Phyllobates brunneus* Cope, 1887. *Phyllobates marchesianus* Melin, 1941, is placed in the genus *Colostethus*. *Colostethus sauli*, from Santa Cecilia, Ecuador, is described as a new species.

Diagnoese are presented which compare and distinguish *tatniatus*, *intermedius*, *marchesianus* and *sauli* from all nominal taxa in the genus. Also, a description is provided of the coloration of the adult in life, and the larvae are described for all species considered

except *intermedius*. The adults and larval mouth parts are figured.

Emmer, Rick, 1991, Husbandry and breeding of dart-poison frogs (*Dendrobates auratus* and *D. tinctorius*). The Vivarium, 2(6): 8-11, 18, 35.

Frost, D. R., 1986, A new *Colostethus* (Anura: Dendrobatidae) from Ecuador. Proceedings of the Biological Society of Washington, 99(2): 214-217.

A new species of dendrobatid frog from southeastern Ecuador, *Colostethus nexipus*, is described. This species is distinguished from other members of *Colostethus* by the combination of extensive toe webbing and the presence of distinct dorsolateral and oblique lateral light stripes.

Goodman, Donald E., 1971, Territorial behavior in a neotropical frog, *Dendrobates granuliferus*. Copeia, 1971(2): 365-370.

Jaeger, Robert G. and Hailman, Jack P., 1981, Activity of Neotropical frogs in relation to ambient light. Biotropica, 13(1): 59-65.

Previous laboratory studies on phototactic behavior of five species of neotropical anurans led to predictions that they would be active in natural habitats under only a limited range of ambient illuminations relative to the range available during 24-h periods. Generally, the species were found to be active within a <4 log-unit range of illuminance and to feed within an even narrower range. Evidence suggests that photic cues may aid in niche partitioning among species. *Bufo marinus* and *Leptodactylus pentadactylus* were active at night, the former in brighter, open places, the latter in the dimmer forest. *Dendrobates auratus* has bimodal diel activity

periods in early morning and late evening. *Bufo typhonius* and *Physalaemus pustulosus* were active during the day, the former in the dimmer forest, the latter in brighter, open areas. Thus, activity rhythms, phototactic behavior, and habitat selection interact to allow an anurans to be active under a relatively narrow range of light levels during a day, theoretically the range within which its eyes are best adapted evolutionarily.

Kluger, Jeffrey, 1991, Pretty Poison. Discover, 12(7): 69-71

(Very short popular article with beautiful color pictures (by Alex Kerstitch) of *Dendrobates pumilio*, *D. imitator*, *Phyllobates bicolor*, an undescribed species of *Dendrobates* from Panama and an unidentified frog sitting on a pencil eraser).

Kneller, Mathias, 1987, Beobachtungen an *Phyllobates azureiventris* im natürlichen Lebensraum und im Terrarium. Herpetofauna, 9(50): 6-8.

Phyllobates azureiventris inhabits shady localities of primary forest in the eastern ranges of the Peruvian Andes, where it occurs sympatry with other dendrobatid frogs. The species makes a good terrarium animal and lives together with other dart-poison frogs released in the author's greenhouse. The behavior and reproductive biology are described, where especially observations on the moment of fertilization are reported.

Kneller, Mathias and Henle, Klaus, 1985, Ein neuer Blattsteiger-Frosch (Salinentia: Dendrobatidae: *Phyllobates*) aus Peru. Salamandra, 21(1): 62-69.

A new dendrobatid frog from the Peruvian eastern Andean foothills is described as *Phyllobates azureiventris* sp. n. Some

comments are made on its ecology, biology and possible position within the genus.

Limerick, Sandra, 1980, Courtship behavior and oviposition of the poison-arrow frog *Dendrobates pumilio*. *Herpetologica*, 36(1): 69-71.

This report describes observations of courtship behavior and oviposition of *Dendrobates pumilio* in Costa Rica. Females approached calling males and followed them to oviposition sites. Pairs often inspected several sites before ovipositing. Males called to females, but there were few tactile interactions or special postures during courtship. Males deposited sperm on leaves and females then laid eggs in the same place. After tadpoles developed, they were carried by an adult to water. In this study, one female was observed carrying a tadpole on her back.

Lockwood, R., 1987, Improving the efficiency of rearing Dendrobatid larvae. 11th Annual Reptile Symposium of Captive Propagation and Husbandry: 43-47.

Lynch, J., 1982, Two new species of poison-dart frogs (*Colostethus*) from Colombia.

Two dendrobatids, provisionally assigned to *Colostethus*, are named from the Cordillera Oriental of Colombia near Bogotá, Colombia. Both species differ from other *Colostethus* in lacking the vocal slits and in having elongate anal sheaths. One species is cavernicolous and occurs at elevations above 3000 m (caves within páramos) (*C. edwardsi*). The other species occurs along mountain streams in areas once supporting high altitude cloud forests (elevations ca. 2400-2800 m) (*C. ruizi*).

_____ and Ruiz-Carranza, P. M., 1982, A new genus and species of poison dart frog (Amphibia: Dendrobatidae) from the Andes of northern Colombia. *Proceedings of the Biological Society of Washington*, 95(3): 557-562.

A diminutive (3 adult females 18.6-19.3 mm slv) dendrobatid frog found in cloud forests on the Cordillera Central of Departamento Antioquia, Colombia, is so unlike other dendrobatids that a new genus (*Atopophrynus*) is proposed for the new species (*A. syntomopus*). Unlike other dendrobatids *A. syntomopus* has extensively webbed toes, has the innermost toe reduced in size and fused to the second and lacks ears. [This frog has since been excluded from the Dendrobatidae by Myers, C. W. and Ford, L. S., 1986, On *Atopophrynus*, a recently described frog wrongly assigned to the Dendrobatidae. *American Museum Novaelette*, 2843: 1-15].

McVey, Margaret E., Zahary, Robert G., Perry, Diane, and MacDougal, John, 1981, Territoriality and homing behavior in the poison dart frog (*Dendrobates pumilio*). *Copeia*, 1981(1): 1-8.

Male *Dendrobates pumilio* return home if displaced, suggesting that their vocal behaviors maintain territories. Many females are also site specific, perhaps because involved in parental care. Observations concerning mating behavior suggest that some *D. pumilio* are at times polygamous.

Myers, Charles W., 1987, New generic names for some Neotropical poison frogs (Dendrobatidae). *Papéis Avulsos de Zoologia, Museu de Zoologia da Universidade de São Paulo*, 36(25): 301-306.

Two new generic names are provided in advance of a more

extensive phylogenetic analysis of alkaloid-producing frogs of the family Dendrobatidae. *Epipedobates*, n. gen., accommodates an assemblage of 22 species of relatively primitive dendrobatids recently assigned either to *Phyllobates* (s.l.) or *Dendrobates* (s.l.). *Minyobates*, n. gen., contains eight minature poison frogs formerly in *Dendrobates*. The older genera, *Dendrobates* and *Phyllobates*, are believed to be monophyletic after these changes. Taxonomically useful characters are found in larval structure, adult morphology and color pattern, behavior and vocalization, and biochemistry of noxious and toxic skin alkaloids.

Péfaur, Jaime E., 1984, A new species of Dendrobatid frog from the coast of Peru. *Journal of Herpetology*, 18(4): 492-494.
(Describes *Colostethus littoralis* from Chorrillos, Lima, Peru).

_____, 1985, New species of Venezuelan *Colostethus* (Dendrobatidae). *Journal of Herpetology*, 19(3): 321-327.

Two new species of frogs of the genus *Colostethus* from the Venezuelan highlands are described. *Colostethus durantii*, from the páramo and subpáramo La Culata, Estado Mérida, is distinguished from all other Venezuelan *Colostethus* by the presence of a transversal sacral flap above the vent and by its white and light blue dotted belly. *Colostethus serranus* from the cloud-forest area of El Morro, Estado Mérida, is distinguished by the lemon-yellow color of the belly and the pink to copper color of the ventral parts of the thighs.

Peterson, J., 1987, Observations of the effects of inbreeding in the poison-arrow frog, *Dendrobates auratus*, at Brookfield Zoo. 11th Annual Reptile Symposium of Captive Propagation and Husbandry: 49-54.

Pough, F. Harvey and Taigen, Theodore L., 1990, Metabolic correlation of the foraging and social behavior of dart-poison frogs. *Animal Behavior*, 39: 145-155.

The foraging and social behavior of four species of Panamanian dart-poison frogs, Dendrobatidae, were recorded and that information was combined with an analysis of aerobic and anaerobic metabolism and with published information about food habits to test predictions about associations among behavioural, ecological and physiological characteristics of anurans. Several generalizations were supported by the data. The widely foraging species of frogs made more prey capture attempts in total and took more prey at each feeding station than did the sedentary species. The widely foraging species had higher capacities for aerobic metabolism and lower anaerobic capacities than did the sedentary species. Other generalizations were not supported. Dietary habits were only loosely related to foraging mode and neither aerobic capacity nor foraging mode was a good predictor of the frequency of vocalization or of agonistic behaviour. High aerobic capacity and widely foraging behaviour may be derived characters in the family Dendrobatidae, but the metabolic and behavioural requirements of territorial defence provide an alternate hypothesis for the association of some ecological and physiological characteristics of frogs.

Pyburn, W. F., 1981, A new poison-dart frog (Anura: Dendrobatidae) from the forest of southeastern Colombia. *Proceedings of the Biological Society of Washington*, 94(1): 67-75.

Dendrobates myersi, a new species of poison-dart frog from the Colombian rain forest, is related to members of the *Dendrobates femoralis* species group. The new frog is terrestrial, diurnal, and probably territorial. Its call is a long series of double-noted chirps

given by isolated individuals. In captivity *D. myersi* is aggressive toward other dendrobatids. The larval and reproductive characteristics of the new species are unknown.

Ramos, Lino, 1989, The toxins of Dendrobatidae. The Journal of Northern Ohio Association of Herpetologists, 15(1): 14-24.

Szelistowski, William A., 1985, Unpalatability of the poison arrow frog *Dendrobates pumilio* to the Ctenid spider *Cupiennius coccineus*. Biotropica, 17(4): 345-346.

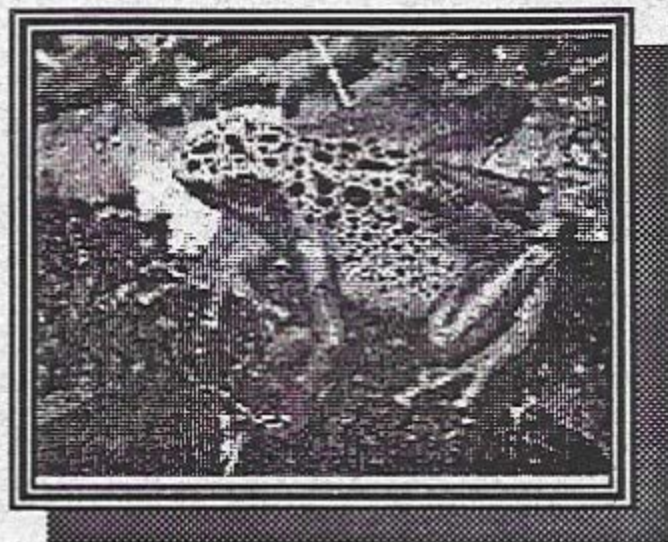
Uka, Ditar, 1986, Some observations on green and black arrow poison frogs at the Perth Zoological Gardens. Thylacinus, 11(3): 6-7.

Vigle, Gregory O. and Miyata, K., 1980, A new species of *Dendrobates* (Anura: Dendrobatidae) from the lowland rain forests of western Ecuador. Breviora, 459: 1-7.

Dendrobates erythromos sp. nov. is described from the lowlands of western Ecuador. The new species is tentatively assigned to the genus *Dendrobates* on morphological grounds and appears to be most closely allied to the Colombian *D. ingeri*. This species may have specific microhabitat requirements which result in a spotty distribution.

Zimmerman, Helmut, 1989, Conservation studies on the 'dart-poison' frogs, Dendrobatidae, in the field and in captivity. International Zoo Yearbook, 28: 31-44.

(Wonderful account of the future of Dendrobatid frogs both in the wild and in captivity. Highly recommended to anyone who can get ahold of a copy)



The Blue Frog Emporium

Finally, a dart-frog T-Shirt really worth having!

This 100% cotton shirt is produced by the Blue Frog Emporium and is the first in a series. The front of the shirt features a four-color process photograph of *Dendrobates azureus* (not a drawing). The photo is surrounded by a bright blue border. Above the photo, the name "*Dendrobates azureus*" appears in crisp blue letters edged in black. Beneath the photo the common name "The Blue Poison-Dart Frog" appears in the same type. On the back of the shirt there is a quotation by the famous Bronx Zoo ornithologist, William Beebe.

"...when the last individual of a race of living things breathes no more, another heaven and another earth must pass away before such a one can be again."

The shirts are available by mail order for \$17.00 each. Special prices are available to herpetological societies wishing to use the shirts for fund raisers. Wholesale prices are available to legitimate retailers upon written request. Please use purchase order blank provided with June issue of the ISSD Bulletin.

Bulletin of the ISSD

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IF THIS BOX IS CHECKED - YOUR MEMBERSHIP FEE IS DUE

Membership dues are as follows: \$20.00 for members living in the U.S.A. and Canada; \$25.00 for members living in Europe and South America. For members holding a personal checking account with a U.S. bank, a personal check will suffice. For those who do not have an account with a U.S. bank, payment should be made using one of the following methods (listed in order of preference): 1.) A U.S. Postal Money Order made out in U.S. dollars. 2.) A Cashier's Check from a U.S. bank, or a U.S. affiliate of a non-U.S. bank, made out in U.S. dollars. 3.) A Cashier's Check from a non-U.S. bank made out in the usual currency of the bank of issue, for an amount which will yield \$28.00 (U.S. \$) when it is exchanged. 4.) Cash - U.S. dollars, wrapped well so that it cannot be seen through the envelope and sent via registered mail. Remittance should be sent to:

Edward Tunstall
ISSD Secretary/Treasurer
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Chandler, Arizona
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